

CLAIMS

We claim the following:

- 1 1. An apparatus, comprising:
2 a packaging device having an output end, the packaging device
3 adapted to package sequenced products;
4 a clamping device adjacent to the output end of the packaging
5 device; and
6 a conveying system downstream from the clamping device, the
7 conveying system moving a drop off tray incrementally,
8 wherein the clamping device holds one of a plurality of packaged
9 sequenced products such that the drop off tray is in a position to stack
10 multiple packaged sequenced products of the plurality of packaged
11 sequenced products into the drop off tray as the drop off tray is moved,
12 incrementally.
- 1 2. The apparatus of claim 1, wherein the sequenced products are mail
2 pieces.
- 1 3. The apparatus of claim 1, wherein the clamping device holds each of
2 the plurality of packaged sequenced products until the conveying system
3 conveys the drop off tray to a predetermined area.
- 1 4. The apparatus of claim 3, further comprising a serrating device which
2 serrates wrap attached between adjacent packaged sequenced products in
3 the drop off tray prior to being stacked in the drop off tray.

1 5. The apparatus of claim 1, further comprising a serrating device which
2 serrates wrap between adjacent packaged sequenced product prior to being
3 stacked in the drop off tray such that each of the adjacent packaged
4 sequenced products in the drop off tray remain connected to one another
5 via the wrap.

1 6. The apparatus of claim 5, further comprising a cutting device for
2 cutting the wrap downstream of a last package of the sequenced products
3 of the plurality of packaged sequenced products to be stacked in the drop
4 off tray.

1 7. The apparatus of claim 1, further comprising a controller controlling
2 the incremental movement of the conveying system based on a parameter
3 of the packaged sequenced product.

1 8. The apparatus of claim 1, wherein the clamping device holds the one
2 of a plurality of packaged sequenced products such that each of the one of
3 the plurality of packaged sequenced products are vertically stacked into
4 the drop off tray.

1 9. The apparatus of claim 1, further comprising:
2 a serrating device which serrates wrap attached between adjacent
3 packaged sequenced products in the drop off tray prior to being stacked in
4 the drop off tray such that the adjacent packaged sequenced product
5 remain connected to one another via the wrap within the drop off tray; and
6 a cutting device for cutting the wrap downstream of a last package
7 of sequenced products of the plurality of packaged sequenced products to
8 be stacked in the drop off tray,

9 wherein the clamping device holds each of the plurality of
10 packaged sequenced products at a predetermined height prior to dropping
11 into the drop off tray such that the each of the plurality of packaged
12 sequenced products does not hit an end of the drop off tray.

1 10. The apparatus of claim 9, further comprising a controller, wherein
2 the controller controls:

3 *the incremental movement of the conveying system based on a*
4 parameter of the packaged sequenced product;

5 the clamping device to hold the each of the plurality of packaged
6 sequenced products at a predetermined height prior to dropping into the
7 drop off tray;

8 the serrating device to serrate the interconnection between adjacent
9 packaged sequenced products prior to dropping into the drop off tray; and

10 the cutting device to cut the wrap at end portion of the last of the
11 packaged sequenced products dropped into the drop off tray.

1 11. An apparatus for packaging and stacking product, comprising:

2 means for sequencing product into a delivery point sequence;

3 means for packaging individual packages of the product for each
4 delivery point sequence;

5 means for dropping the individual packages into a vertical stacked
6 position in a takeaway container; and

7 means for incrementally moving the takeaway container a
8 predetermined distance such that the individual packages can fill the
9 takeaway container prior to a new takeaway container being positioned for
10 filling.

1 12. The apparatus of claim 11, wherein the product is mail pieces.

1 13. The apparatus of claim 11, further comprising means for serrating
2 wrap which wraps the product into the individual packages, the serrating
3 means serrates the wrap at an interconnection between adjacent individual
4 packages to ensure that the individual packages remain in a sequenced
5 order.

1 14. The apparatus of claim 13, further comprising a controlling means for
2 controlling the serrating means to serrate that the wrap at the
3 interconnection between adjacent individual packages.

1 15. The apparatus of claim 11, wherein the dropping means is a clamping
2 device which holds the individual packages until the takeaway tray is
3 properly aligned with a next of the individual packages.

1 16. The apparatus of claim 15, further comprising means for cutting wrap
2 which wraps the product into the individual packages, the cutting means
3 cuts the wrap after a last of the individual packages to be stacked into the
4 takeaway tray.

1 17. The apparatus of claim. 16, further comprising a controlling means
2 for controlling the cutting means to cut that the wrap after the last of the
3 individual packages to be stacked into the takeaway tray.

1 18. A method of stacking packaged sequenced products, comprising the
2 steps of:
3 aligning a drop off tray with a packaging mechanism;

4 packaging sequenced product into individual packages of
5 sequenced product;
6 dropping the individual packages of sequenced product into the
7 drop off tray;
8 incrementally moving the drop off tray a predetermined distance
9 about equal to a thickness of each of the individual packages of sequenced
10 product; and
11 dropping further individual packages of sequenced product into the
12 drop off tray until the drop off tray is filled.

1 19. The method of claim 18, further comprising:
2 serrating wrap at an interconnection point between adjacent
3 individual packages of sequenced product prior to dropping into the drop
4 off tray to ensure that the individual packages of sequenced product
5 remain in order in the drop off tray; and
6 cutting the wrap after a last of the individual packages of
7 sequenced product is dropped into the drop off tray,
8 wherein the stacking is vertical stacking of the individual packages
9 of sequenced product.

1 20. The method of claim 19, further comprising the steps of:
2 determining when the drop off tray is full with the individual
3 packages of sequenced product and supplying a new container for filling:
4 determining when to serrate the interconnection point between the
5 adjacent the individual packages of sequenced product; and
6 determining when to cut the wrap after the last of the individual
7 packages of sequenced product is dropped into the drop off tray.